



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/912,214      | 07/24/2001  | David M. Filgas      | GSIL0169PUS         | 6400             |

22045 7590 07/14/2003

BROOKS & KUSHMAN  
1000 TOWN CENTER 22ND FL  
SOUTHFIELD, MI 48075

EXAMINER

SCOTT JR, LEON

ART UNIT PAPER NUMBER

2828

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |  |   |  |
|------------------------------|--------------------------------------|--|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/912,214 |  | <b>Applicant(s)</b> <i>W</i><br>DAVID M. FILGAS |  |
|                              | <b>Examiner</b><br>Leon Scott, Jr.   |  | <b>Art Unit</b><br>2828                         |  |
|                              |                                      |  |   |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on Amend't A filed 7/16/02.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-32 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All   b) ☐ Some \*   c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

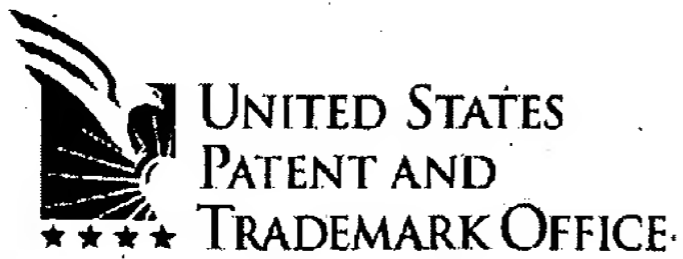
a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121

**Leon Scott, Jr.**  
**Primary Examiner**

**Attachment(s)**

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |



---

**The following is a quotation of the second paragraph of 35 U.S.C. 112:**

**The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

**Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

**In lines 6 and 7 of claim 1, it is not clear from the language of the claim that the device has sections, claim 1 is indefinite and incomplete. Further, if the device does have sections; it is not clear how output mode control is achieved in each of the different sections; claim 1 is *functional at the point of novelty*. In claim 3 it is not clear within the context of claim language how the active and passive members function in the device as a whole; claim, 3 is indefinite and incomplete. In lines 2 and 3 of claim 4 it is not clear what constitutes a *pump light containment component*, nor is it clear how said component functions in the device as a whole; claim 4 is indefinite and incomplete. Since the core in claim 1 is defined as having a pump, It is not clear in line 3 of claim 4 what pumping section of the device is being claimed; claim 4 is indefinite and incomplete. In claim 7, since it is not clear that a cladding will not provide mode control, thus, it can not be determined what a *mode control cladding* does that is different from a cladding; claim 7 is indefinite and incomplete. In claim 16 it is not clear *how* the laser input surface is different, claim 16 is indefinite and incomplete. Since nothing has been recited in claim 18/1 which indicates that the waveguide device has a *mode***

**c ntrol secti n**, applicant recitati n f uch a ecti nam unt t  
Inferential claiming of tructure; claim 18 i ind finite and  
incomplete. Since claim 1 recites a *means for providing pump  
light confinement*, It is not clear what *pumping section* of the  
device is being recited in line 2 of claims 18 and 10; claims 18 and  
19 are Indefinite and incomplete. Since nothing has been recited  
which would indicate that the refractive indices of the core and  
the pump cladding are different from each other, claiming that the  
mode control cladding has a refractive index between the core  
and the pump cladding renders claim 24 indefinite and incomplete.  
Claims 25 and 26 are alternative in scope. In claim 31 it is not  
clear how the separating step separates the functions of pump  
light confinement and output mode control, what *pump light  
confinement* and what *output mode control*; clearly applicant is  
making claim for method limitations which have not method steps  
recited in the claim; claim 31 is indefinite and incomplete. The  
*wherein clauses* in claim 32 do not recite method steps but recite  
structure, thus it is not clear what applicant is relying upon to  
carry the claim, method or apparatus; claim 32 is indefinite and  
incomplete.

The following is a quotation of the appropriate paragraphs of  
35 U.S.C. 102 that form the basis for the rejections under this  
section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this  
country, or patented or described in a printed publication in this or  
a foreign country, before the invention thereof by the applicant for  
a patent.

(b) the invention was patented or described in a printed  
publication in this or a foreign country or in public use or on sale  
in this country, more than one year prior to the date of application  
for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1,2,4,5,10,12,32 and 33 are rejected under 35 U.S.C. 102(b) as being *anticipated* by Dental et al (4,787,086)(see fig. 1).

Dental et al ( '086) discloses: a waveguide device which acts as a waveguide in at least one direction, the device comprising: a core (23) having a pump input surface (25) for receiving a pumping radiation from semiconductor laser (10) at a pumping wavelength and at least one output surface (24) for emitting a laser beam at an output wavelength; and means for providing pump (10) light confinement (20,22) and means for providing output mode control (see col.2 lines 53-59) in different sections of the device along the direction of the beam propagation ( see fig. 1). Dental et al ( '086) further discloses :that the optical fiber (21) is a single mode optical fiber and has a cladding (22) surrounding core (23). The structure of the claims will *inherently* perform the method of claims 31 and 32.

Claims 1,2-4,6,8,10,12,14 and 31-32 are rejected under 35 U.S.C. 102(a) as being *anticipated* by Hsu et al (6,263,002).

Hsu et al ( '002) discloses: a waveguide device (see figs.1A - 1E) which acts as a waveguide in at least one direction, the device comprising: a core(7) having a pump input surface for receiving a pumping radiation from semiconductor laser(5) at a pumping wavelength and at least one output surface for emitting a laser beam at an output wavelength, a fiber integrated mirror (3) is deposited on a facet of the optical fiber (7); a waveguide portion (10) containing optical\_fiber (7) with an embedded mirror (12) between the waveguide portion and the fiber, the mirror which is

integral with the fiber is typically deposited at the waveguide ferrule end face at a fiber end (see col.7 line 42-67 and col.8 line 1-18); and means for providing pump light confinement and means for providing output mode control (see col.7 lines 47-48) in different sections of the device along the direction of the beam propagation (see figs. 1A - 1E). Hsu et al ('002) further discloses that: the optical fiber(7) is a single mode optical fiber with mode control which includes a grating (15) in contact with the core(7), the FBG (15) is within the optical fiber and may be positioned within the fiber portion inside of the ferrule or in the fiber portion extending outside of the ferrule (see fig. 1C, col. 8 lines 32-41 and fig.1E, col.8 lines 52-63); the use of a fiber-waveguide mirror (FIG. 1B) as the top mirror of the VCSEL provides for mode-field shaping, confinement and improved laser performance(see col.6 lines 27-39); metal ferrule or metal-coated glass ferrule can be provided with an axial bore for receiving and bonding to an optical fiber to provide pump laser light. Finally since the core has a laser input surface for receiving a source laser beam to be amplified, it is inherent that the device functions as an amplifier (claim 14). The structure of the claims will *inherently* perform the method of claims 31 and 32.

Claims 1,2,4,7,10,14,16,17 and 31 are rejected under 35 U.S.C. 102(b) as being *anticipated* by Snitzer et al (4,637,025).

Snitzer et al ('025) discloses: a single mode optical fiber waveguide(12) which *inherently* acts as a waveguide in at least one direction, the device comprising: a core (16) having a pump input surface(23) for receiving a pumping radiation from laser diode (20) at a pumping wavelength and at least one output surface for emitting a laser beam at an output wavelength; and means for providing pump (14) light confinement and means for providing output mode control (see col.2 lines 53-59) in different sections of the device along the direction of the beam propagation (see fig. 1). Snitzer et al ('025) further discloses: that the optical fiber (12) is a single mode optical fiber and has a cladding (18) surrounding core (16), the optical fiber (12) core (16) fabricated

from a host glass deposited with an active layer material and a cladding (18) that surrounds the core. Alternatively, the cladding can contain the actual laser material in a thin layer adjacent to the core so that the single mode light distribution overlaps the active material. The preferred active material is neodymium. Pump light is coupled into the optical fiber at an intensity sufficient to produce a significant amplification of the spontaneous emission, the pump light is coupled into one end of the fiber and a dichroic filter(24) is interposed in the light path between the pump light and the optical fiber to pass pump light into the core and reflect the spontaneous emission of the active material back into the core and toward the output (see abstract and col.3 lines 13-68); the index of refraction of the core (16) is selected to be higher than that of cladding (18) so that the pumping light introduced into the core and light emitted by the active material is contained within or in the vicinity of the core, and one end of the waveguide or fiber can be made reflective while the output end provides minimal reflectivity. For example, the output end of the fiber segment may be cleaved at an angle, and/or coated with antireflection coating(see col.5 lines 38-68). The N/A of the mode control section being lower than a pumping section of the device is inherent in the reference.(see figs. 1 and 2 ,also see col. 3 lines 65-68 and col.4 lines 1-4, see abstract).

Claims 1,2,6,10 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Scifres et al (4,358,851). (see all figs)

Scifres et al ( '851) discloses : a waveguide device (see all figs.) which acts as a waveguide in at least one direction, the device comprising: a core(12,22) having a pump input surface for receiving a pumping radiation from laser emitter(16,42) at a pumping wavelength and at least one output surface for emitting a laser beam at an output wavelength, where If the emitter is a semiconductor laser(42), the device may be also employed to provide single longitudinal mode control at the selected wavelength or bandpass (see abstract); a fiber integrated mirror (14) is deposited on a facet of the optical fiber (12,22)\* s e c l. 3 line 2-6 ,c l.5 line 1-6); a wav guide portion (10)

containing optical\_fiber (12,22 ) with an embedded mirror (14) between the waveguide portion and the laser, the mirror which is integral with the fiber is typically deposited at the waveguide or end face at a fiber end (see figs 7-13) In different sections of the device along the direction of the beam propagation . Scifres et al ( '851) further discloses that: the optical fiber(7) is a single mode optical fiber with mode control which includes a grating (15) in contact with the core(7), the FBG (15) is within the optical fiber and may be positioned within the fiber portion inside of the ferrule or in the fiber portion extending outside of the ferrule (see fig 7-13); the use of a fiber-waveguide mirror (FIG. 1B) as the top mirror of the VCSEL provides for mode-field shaping, confinement and improved laser performance(see col.6 lines 27-39); metal ferrule or metal-coated glass ferrule can be provided with an axial bore for receiving and bonding to an optical fiber to provide pump laser light. Finally since the core has a laser input surface for receiving a source laser beam to be amplified, it is inherent that the device functions as an amplifier (claim 14).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snitzer et al (4,637,025), as applied above when considered with Nilsson et al (6,288,835).

Nilsson et al ('835) discloses a single mode waveguiding cladding pumped laser in which the fiber can be cladding

**Art Unit: 2828**

**pump d( e fig .1 and 15 and ab tract). iven the tructure of th reference , it w uld be obvi u t that one f rdinary kill in the art desiring to cladding pump the optical fiber of Snitzer et al ('025) would be motivated to use the teaching of Nilsson et al ('835) in a device built around the teachings of Snitzer et al ('025) since both references are concerned with *mode control* of the optical fiber, applicants device is obvious.**

**Claims 9,11,13-15,17,18 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over when considered with Meissner et al (6,160,824) and Hutchison (5,504,762)**

**Meissner et al('824) discloses: a compound planar waveguide comprising multiple confinement structures that provides independent containment of pump and laser radiation. The planar waveguide may include a central laserable core layer substantially sandwiched by at least two non-laserable cladding layers to provide an interface between the inner surfaces of the cladding layers and the gain medium core to define a first waveguide by virtue of an index of refraction discontinuity for containing developed laser radiation, and wherein the outer surfaces of the cladding layers define a second waveguide by virtue of an index of refraction discontinuity for containing pump radiation within the waveguide; the laser waveguide provides confinement of developed laser radiation which may be independently configured from the waveguide structure that confines the pump radiation. The planar waveguide layers may be also optically bonded together and consist of different optical quality crystals or glass (see col.4 19-45)**

**Art Unit: 2828**

**; a c mp und waveguid tructure in which th d v l ped la r radiation is confined by a waveguide structure that ha a relatively smaller numerical aperture than another independent waveguide structure used to confine the pump radiation (see abstract). The waveguide structure that confines the developed laser radiation may be independently modified from the waveguide structure that confines the pump radiation. Hutchison ('762) discloses: Use of coupling optics (18) to collimate laser diode source (10) before butt coupling to an optical fiber significantly improves coupling efficiency and permits the use of fibers with a low numerical aperture (NA), such as 0.1. Coupling optics (18) are employed to adjust the NA of a laser diode source to an intended application. Coupling optics can be any number of devices, including but not limited to cylindrical or non-cylindrical cross-section fibers. Thus given the teachings of Hutchison ('762) it would be obvious for one of ordinary skill in the art desiring to use a fiber with a low N/A to use coupling optics to adjust the NA of the a laser, applicants device is obvious.**

**Byer et al (4,860,295) is cited for its teaching of a cladding for transverse pumped solid state laser.**

**Meissner et al (5,852,622) is cited for its teaching of solid state lasers with composite crystals or glass.**

**Hogg et al ( 5,237,630) is cited for its teaching of a fiber optic device with a reflector located at a splice joint.**

**Aoyagi et al is cited for its teaching of an optical fiber light amplifier.**

**Shaw et al (5,048,026) is cited for its teaching of a fiber optic amplifier.**

**Grubb et al(5,905,621) is cited for its teaching of a fiber multimode la er.**

**DiGiovanni (5,949,941) is cited for its teaching of cladding pumped fiber structures.**

**Chinen('604) is cited for its teaching of an optical amplifier using a semiconductor laser as a multiplexer.**

**Hughes(5,084,882) is cited for its teaching of a scaleable bundle of fiber lasers.**

**Lang et al (6,477,295) is cited for its teaching of pump coupling of double clad fibers.**

**Grasso et al (6,087,108) is cited for its teaching of a double core active fiber optical amplifier having a wide band signal wavelength.**

**Snitzer(5,432,806) is cited for its teaching of a multiply doped rare earth laser.**

**Ohishi et al (6,373,863) is cited for its teaching of a ytterbium laser system.**

**Takamaiya et al (4,581,744) is cited for its teaching of a surface emitting injection type laser.**

**Kay (3,684,980) is cited for its teaching of a high effective absorption coefficient solid state laser.**

**Shaw et al (4,553,238) is cited for its teaching of a fiber optic amplifier.**

**Holly (3,222,615) is cited for its teaching of a cylindrical laser utilizing internal reflection techniques.**

**Scifre (5,566,196) is cited f r it teaching of a multipl core fiber laser and optical amplifier.**

**Snitzer et al (4,815,-79) is cited for its teaching of optical fiber lasers and amplifiers.**

**Anthon et al (6,411,762) is cited for its teaching of an optical fiber with irregularities at cladding boundary.**

**Hughes (4,6823,335) is cited for its teaching of a composite laser oscillator.**

**Waarts et al(6,298,187) is cited for its teaching of high power fiber gain media.**

**Meissner et al (5,563,899) is cited for its teaching of composite solid state lasers.**

**Shinbori et al (5,349,600) is cited for its teaching of solid state lasers having claddings.**

**Hsu et al (5,425,039) is cited for its teaching of single frequency Fabry Perot microlasers.**

**Sugimoto et al (6,560,392) is cited for its teaching of optical amplifying glass fibers.**

**Hughes (4,875,215) is cited for its teaching of a fiber communication laser system.**

**Kleinerman (5,485,480) is cited for its teaching of fiber optic lasers and amplifiers.**

**Kringlebotn et al (2002/0076156) is cited for its teaching of a waveguide laser source.**

**Art Unit: 2828**

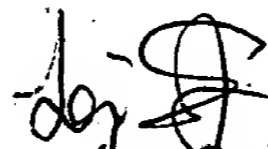
**Rall t al (6,031,849) i cited f r it teaching f a high p w r  
three level fiber laser.**

**Applicant's arguments with respect to claims 1-32 have been  
considered but are moot in view of the new ground(s) of rejection.**

**Any inquiry concerning this communication or earlier  
communications from the examiner should be directed to Leon  
Scott, Jr. whose telephone number is 703-308-4884. The  
examiner can normally be reached on Monday - Friday, 6:30am -  
5:00pm.**

**If attempts to reach the examiner by telephone are  
unsuccessful, the examiner's supervisor, Paul P. Ip can be  
reached on (703)308-3098. The fax phone numbers for the  
organization where this application or proceeding is assigned are  
703-308-7721 for regular communications and 703-308-2864 for  
After Final communications.**

**Any inquiry of a general nature or relating to the status of  
this application or proceeding should be directed to the  
receptionist whose telephone number is 703-306-3431.q**



**Leon Scott, Jr.**

**Primary Examiner**

**Leon Scott, Jr.**

**Primary Examiner**

**Art Unit 2828**

**lsjr**

**June 30, 2003**